IN THE CLAIMS

Please revise the claims as follows:
129. (New) A method of making mesoporous silica materials, comprising the steps
of
(a) combining a silica precursor with an aqueous solvent, an acid and a
surfactant having an ammonium cation into a silica precursor solution,
(b) templating the silica precursor with the surfactant and obtaining the
mesoporous material from the templated silica precursor,
(c) forming said silica precursor solution into a preform; and
(d) rapidly evaporating said aqueous solvent from said preform for
obtaining the mesoporous material, wherein the improvement comprises:
(i) providing said aqueous solvent in an amount resulting in
complete hydrolysis and providing said acid in an amount maintaining a hydrolyzed
precursor and avoiding gelation or precipitation; and
(ii) providing said surfactant and said silica precursor in a mole
ratio that is above a lower mole ratio that produces a non-porous silica phase and below an
upper mole ratio that produces a lamellar phase.
130. (New) The method as recited in claim 129, wherein said lower mole ratio is
about 0.05.
131. (New) The method as recited in claim 129, wherein said upper mole ratio is
about 0.3.
132. (New) The method as recited in claim 129, wherein said acid is added in an
amount resulting in a pH of said silica precursor solution of from about 1 to about 4.
133. (New) The method as recited in claim 132, wherein said pH is about 2.
134. (New) The method as recited in claim 129, wherein the step of forming

(New) The method as recited in claim 134, wherein said alcohol is ethanol.

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includes diluting with an alcohol.

	136. (New) The method as recited in claim 129, wherein said aqueous solvent, said
acid.	and said surfactant are premixed before combining with said silica precursor,

137. (New) The method as recited in claim 129, wherein said mesoporous materials
are in a geometric form selected from the group consisting of fiber, powder, and film,
138. (New) The method as recited in claim 129, wherein said forming is spin-
casting.
139. (New) The method as recited in claim 129, wherein said forming is spraying.
140. (New) The method as recited in claim 129, further comprising adding a pre- polymer or a polymer to said silica precursor solution making a pituitous mixture.
141. (New) The method as recited in claim 129, wherein said forming is drawing.
142. (New) The method as recited in claim 129, wherein said forming is squeegeeing.
143. (New) The method as recited in claim 129, further comprising the step of adding a metal compound to the silica precursor solution.
144. (New) The method as recited in claim 143, wherein said metal compound is selected from the group consisting of metal halide, metal nitrate, and combinations thereof.
145. (New) The method as recited in claim 144, wherein said metal halide is a metal chloride.
146 (New) The method as recited in claim 144, wherein said metal is selected from

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the group of aluminum, iron and combinations thereof.

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147. (New) The	e method as recited in claim 129, wherein	said silica precursor is an
alkoxide silica precurso		
148. (New) Th	e method as recited in claim 129, wherein	said aqueous solvent
amount is characterized	by a ratio of said aqueous solvent to said	silica precursor of about /.
149. (New) Th	ne method as recited in claim 129, wherein	said acid amount is
characterized by a ratio	of said acid to said silica precursor of abo	out 0.1.
150. (New) Th	he method as recited in claim 129, further	comprising adding a
swelling agent to the si	ilica precursor solution.	
		' 1llim a agent is
151. (New) T	he method as recited in claim 150, wherei	n said sweiting agent is
1,3,5-trimethylbenzen	<u>.e.</u>	
		comprising the step of
	The method as recited in claim 129, further	COMPRISING CO.
calcining the mesopor	rous material.	•
	A method of making a mesoporous silica f	ilm, comprising the steps of
153. (New) 4	A method of making a mesopolous of	ous solvent, an acid and a
(a)	ammonium cation into a silica precursor s	olution,
surfactant having an	templating the silica precursor with the su	rfactant and obtaining the
	from the templated silica precursor,	
mesoporous material	forming said silica precursor into a prefor	m; and
(c)	rapidly evaporating said aqueous solvent	from said preform for
- tur	orous material, wherein the improvement	comprises:
	(i) said silica precursor is tetraethoxy	silane:
	(ii) providing said aqueous solvent in	a superstoichiometric amount
and providing said a	acid in an amount maintaining a hydrolyze	d precursor and avoiding
gelation or precipita	ation:	
	(iii) providing said surfactant and said	silica precursor in a mole
ratio that is above a	lower mole ratio that produces a non-pore	ous silica phase and below and
upper mole ratio the	at produces a lamellar phase; and	
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(iv) said forming inc	cludes diluting with an alcohol.
154. (New) The method as recited	in claim 153, further comprising adding a pre-
olymer or a polymer to said silica precurso	or solution making a pressure
155. (New) The method as recited	in claim 153, wherein said rapidly evaporating is
y spin-casting.	
156. (New) A method of making a	mesoporous film on a substrate, the method
comprising the steps of:	
(a) combining a silica pre	cursor with an aqueous solvent, an acid catalyst
nd an ammonium cationic surfactant into	a precursor solution;
(b) dispensing said precu	rsor solution onto the substrate:
(c) forming a film by eva	poration of the solvent in less than 5 minutes; and
(d) heating the film on th	e substrate to a temperature sufficient to
decompose the surfactant, thereby produc	ing a mesoporous film on the substrate.
decompose the surmerment	
157. (New) The method of claim	156 wherein the precursor solution is a silica
137. Unow, and wherein the surfac	tant and the silica precursor solution are in a mole
precursor solution and wretern mole ratio that	produces a non-mesoporous silica phase and
below an upper mole ratio that produces a	a lamellar phase.
below an upper more ratto that produces	
158. (New) The process of claim	m 156, wherein the film exhibits an index of
refraction between 1.16 and that of silica	
retraction between 1.19 and	-
159. (New) A process to form n	nesostructured films, comprising:
(a) preparing a precurs	or sol containing a soluble source of silica, an
aqueous solvent, an ammonium cationic	surfactant and an acid catalyst; and
(h) denositing the nreci	ursor sol on a substrate wherein evaporation of
(b) depositing me press	causes the formation of said mesostructured films
on the substrate surface.	

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160. (New) The process of claim 159 wherein the aqueous solvent and the catalys	<u>.</u>
re provided in amounts that maintain a hydrolyzed precursor sol while avoiding gelation	<u>01</u>
precipitation.	
161. (New) The process of claim 159 wherein the soluble source of silica is a siliprecursor alkoxide or tetrachlorosilane and wherein the surfactant and the soluble source of silica are in a mole ratio that is above a lower mole ratio that produces a non-porous silicate phase and below an upper mole ratio that produces a lamellar phase.	01
162. (New) The process of claim 159, wherein the ammonium cationic surfactant further includes alkyl triethylammonium chloride or bromide surfactants with different chain lengths.	<u>ıt</u>
163. (New) The process of claim 159, further comprising the step of calcining s	<u>aid</u>
film at 450°C.	
164. (New) The process of claim 159, wherein the precursor sol is deposited on substrate by spin coating.	<u>. a</u>
165. (New) The process of claim 159, wherein said soluble source of silica is a alkoxide silica precursor or tetrachlorosilane.	<u>n</u>
166. (New) The process of claim 159, wherein the films exhibit an index of refraction between 1.16 and that of silica.	
167. (New) A process to form a mesoporous structure, comprising: (a) preparing a precursor sol containing a soluble source of silica, an alcohol and water solvent, an ammonium cationic surfactant, and an acid catalyst, whe said solvent is provided in an amount resulting in complete hydrolysis and said acid catalyst is in an amount to maintain a hydrolyzed precursor and to avoid gelation or precipitation said precursor sol; (b) forming the precursor sol into a preform;	4144 10
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	A Community of A state t	hat forms a
	(c) evaporating said solvent from the preform at a rate t	nat iomis u
mesostructur	ed material; and	conorous structure.
	(d) calcining the mesostructured material to form a mes	Oporoug par
168,	(New) The process of claim 167, wherein said precursor	sol contains alcohol
which is a b	yproduct of hydrolysis, and said mesoporous structure is a fi	ilm.
169	(New) The process of claim 167, wherein said preform is	a droplet, said
alcohol is a	byproduct of hydrolysis, and said sol is spray dried to form	a powder.
170	(New) The process of claim 167, wherein said drying is	preformed in less
than 5 min		
man 5 mm		
171.	(New) The process of claim 167, wherein said precursor	sol contains dilutant
	d wherein the mesoporous structure is a film.	
alconol, an	u whotem the total and the tot	
172	(New) The process of claim 167, wherein the mesoporou	<u>is structure is a film</u>
1/2.	in the film exhibits an index of refraction of between 1.16 ar	nd that of silica.
and where	ш ше при схидоло за	
1.70	(New) The process of claim 167, wherein the said prec	cursor sol contains
<u>173.</u>	hich is a byproduct of hydrolysis, and wherein said mesostru	icture is a film.
alcohol W	nich is a dyproduct of hydroxy	
	(New) The process of claim 173, wherein the film exh	ibits an index of
174.		
refraction	of between 1.16 and that of silica.	•
	(New) The process of claim 167, wherein said preform	n is a droplet, wherein
<u>175</u>	nol is a byproduct of hydrolysis, and wherein said precursor	sol is spray dried.
said alcol	nol is a byproduct of hydrolysis, and wherem the	
	(New) The process of claim 167, wherein said evapor	rating is performed in
176		
<u>less than</u>	5 minutes.	
	7. (New) The process of claim 167, wherein said solubl	e source of silica
17'		,
includes	a silica alkoxide precursor or tetrachlorosilane.	
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178. (New) A process to form a mesoporous structure, comprising:
(a) prenaring a precursor sol containing a soluble source of silica, an
the land water solvent, an ammonium cationic surfactant, and an acid catalyst, wherein
the provided in an amount resulting in complete hydrolysis and said acid to be
said solvent is provided in an expension and to avoid gelation or precipitation in said
precursor sol; (b) forming the precursor sol into a preform;
(c) evaporating said solvent from the preform at a rate that forms a
wherein said mesostructured material contains surfactant; and
(d) calcining the mesostructured material to form a mesoporous structure.
(d) Calching the state of the s
179. (New) A process to form a mesostructure, comprising:
(a) preparing a precursor sol containing a soluble source of silica, water
and alcohol solvent, an ammonium cationic surfactant and an acid catalyst; and
(b) evaporating said solvent in less than 5 minutes to cause the formation of
a mesostructure, wherein said mesostructure contains surfactant.
a mesostructure, wherein said mesostructure
180. (New) The process of claim 179, wherein the mesostructure is a film, and
wherein the film exhibits an index of refraction of between 1.16 and that of silica.
wherein the film exhibits an mides of regularity
181. (New) A process to form a mesostructure, comprising:
(a) preparing a precursor sol containing a soluble source of silica, a water
and alcohol solvent, an ammonium cationic surfactant and an acid catalyst, and
action in less than 5 minutes to cause the formation of
a mesostructure.
182. (New) The process of claim 181, wherein said solvent is evaporated in less
than 1 minute.
183. (New) The process of claim 181, wherein said solvent is evaporated in less
than 10 seconds.
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	184. (New) The process of claim 183, wherein the mesostructure is a film, and	
	184. (New) The process of claim 185, wherein the week 1 16 and that of silica.	
	wherein the film exhibits an index of refraction of between 1.16 and that of silica.	
	the state of the s	
	185. (New) The process of claim 181, wherein the said precursor sol contains	
	both dilutant alcohol and alcohol which is a byproduct of hydrolysis, and wherein said	
	mesostructure is a film.	
1	186. (New) The process of claim 181, wherein said preform is a droplet, said	
\	alcohol is a byproduct of hydrolysis, and said sol is spray dried.	
	·	
	187. (New) The process of claim 181, wherein the ammonium cationic surfactant	
	further includes alkyl triethylammonium-chloride or bromide surfactants with different	
	chain lengths.	
•	Chair lengths.	1
	188. (New) A calcined mesoporous silica film on a substrate formed by a process	
)
	comprising: dispensing an acid catalyst- and silica precursor- and aqueous solvent- and	
	surfactant-containing solution on the substrate; forming a film on the substrate by rapid evaporation of the solution on the substrate;	: ,
	forming a film on the substrate by tapid evaporation a temperature sufficient	
	heating the film on the substrate for a time and to a temperature sufficient	
	substantially to remove any residual solvent; and	
	calcining the film at a temperature at or above 350°C.	
	Six and substrate formed by approcess	
	189. (New) A calcined mesoporous silica film on a substrate formed by a process	
	comprising:	
	dispensing a catalyst- and silica precursor- and solvent- and surfactant-containing	`
	solution on the substrate;	
	forming a film on the substrate by rapid evaporation of the solution on the substrate;	
	and and	
	heating the film on the substrate for a time and to a temperature sufficient	
	substantially to remove any residual solvent; and	
`	calcining the film at a temperature at or above 350°C.	
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